

# Healthcare and Community Associated Non-Tuberculosis Mycobacterium Infections



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# Mycobacterium

- *Aerobic, non-spore forming, non-motile bacilli.*
- *The cell wall contains mycolic acids and other fatty acids prevents access by common aniline dyes.*
- *Natural division: slow and rapid growers (<7 days to grow in solid media).*
- *More resistant to acid or alkalis and some chemical disinfectants*
- *NTM are free living mycobacteria and usually found in association with water*



**Table 1. The Runyon classification and characteristics of clinically significant nontuberculous mycobacteria (NTM).**

Species (Runyon group)	Ideal temperature for growth	Time for growth, days	Colony morphology	Frequency of nosocomial infections	Comments
Photochromogens (I) <sup>a</sup>					
<i>Mycobacterium kansasii</i>	37°C	10–20	Yellow (with light)	++	Occasional scotochromogenic or nonchromogenic strains; distinctive pattern on AFB smear
<i>Mycobacterium marinum</i>	30°C	5–15	Deep yellow (with light), smooth to rough	+	Water exposure
Scotchchromogens (II) <sup>b</sup>					
<i>Mycobacterium szulgai</i>	37°C	10–25	Orange <sup>b</sup> , smooth or rough	+	Photochromogen when grown at 25°C
<i>Mycobacterium xenopi</i>	42°C	15–30	Yellow and rough, with aerial mycelium	++	Occasionally nonpigmented; growth is slow at 37°C and absent at 25°C
<i>Mycobacterium gordonae</i>	37°C	10–15	Deep yellow-orange and smooth	+	
Nonphotochromogens (III) <sup>c</sup>					
<i>Mycobacterium avium</i>	37°C	10–20	3 variants: smooth-opaque raised, smooth-transparent flat, and rough	+++	Smooth transparent flat colonies tend to be more virulent and antimicrobial resistant; some colonies may have yellow pigment
<i>Mycobacterium haemophilum</i>	30°C	15–20	Smooth or rough	+	Minimal growth seen at 37°C; biochemically inert
Rapid growers (IV) <sup>d</sup>					
<i>Mycobacterium fortuitum</i>	37°C	3–5	Transparent to cream-colored smooth with branching, filamentous extensions	+++	May grow on 5% sheep blood agar; occasionally see rough colonies with aerial mycelium
<i>Mycobacterium chelonae</i>	28°C	3–5	Transparent to cream-colored smooth	+++	May grow on 5% sheep blood agar
<i>Mycobacterium abscessus</i>	35°C	3–5	Transparent smooth	+++	

**NOTE.** AFB, acid-fast bacilli; +, rare; ++, occasional; +++, frequent.

<sup>a</sup> Typically requires light for the production of pigmented colonies.

<sup>b</sup> Light not typically required for the production of pigmented colonies.

<sup>c</sup> Typically nonpigmented colonies.

<sup>d</sup> Rapid growers exhibit growth in <7 days under optimal conditions. *Mycobacterium neoaurum* is a rapid grower that rarely causes disease.



A

*Photochromogen*



B



C

*Scotochromogen*



D



E

*NonPhotochromogen*



F

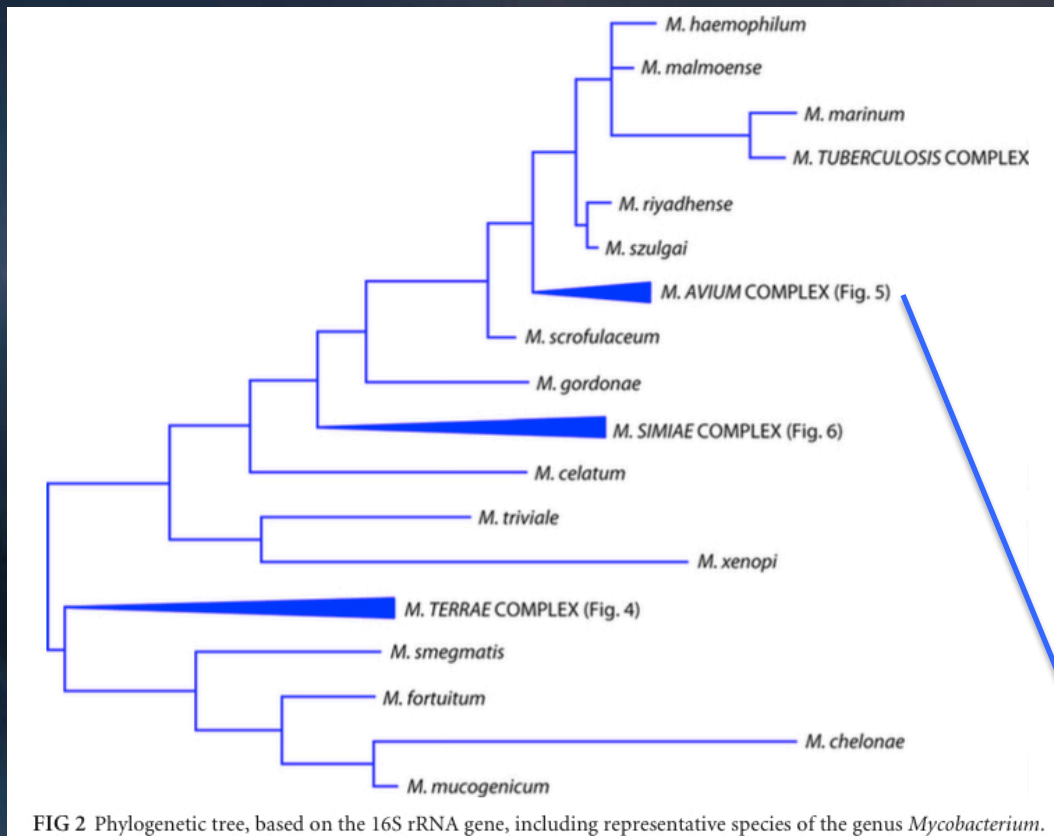


FIG 2 Phylogenetic tree, based on the 16S rRNA gene, including representative species of the genus *Mycobacterium*.

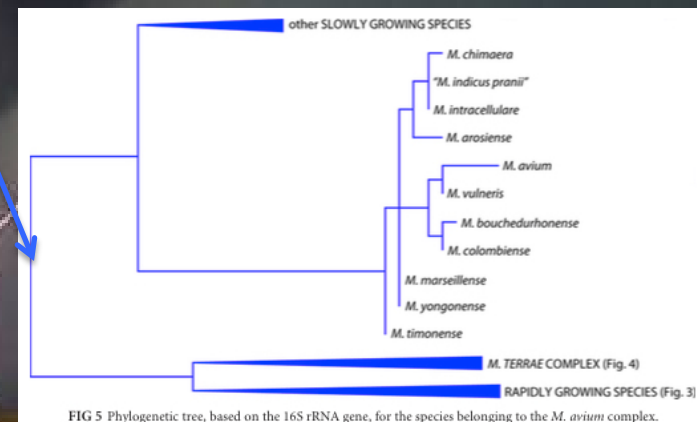


FIG 5 Phylogenetic tree, based on the 16S rRNA gene, for the species belonging to the *M. avium* complex.

## SLOWLY GROWING NTM .....

*Mycobacterium algericum*.....

"*Mycobacterium alsiense*" .....

*Mycobacterium arosiense* .....

*Mycobacterium bouchedurhonense*

*Mycobacterium engbaekii* .....

*Mycobacterium europaeum* .....

*Mycobacterium fragae* .....

*Mycobacterium heraklionense*.....

"*Mycobacterium indicus pranii*" .....

*Mycobacterium koreense* .....

*Mycobacterium kumamotonense* ..

*Mycobacterium kyorinense* .....

"*Mycobacterium lepromatosis*" .....

"*Mycobacterium liflandii*" .....

*Mycobacterium longobardum*.....

*Mycobacterium mantenii*.....

*Mycobacterium marseillense* .....

*Mycobacterium minnesotense*.....

*Mycobacterium noviomagense*.....

*Mycobacterium paraffinicum*.....

*Mycobacterium paragordoniae* ..

*Mycobacterium parakoreense* ..

*Mycobacterium paraseoulense* ..

"*Mycobacterium paraterrae*" .....

*Mycobacterium riadhense*.....

*Mycobacterium senuense* .....

*Mycobacterium seoulense* .....

*Mycobacterium sherrisii* .....

"*Mycobacterium shigaense*" .....

*Mycobacterium shinjukuense*...

"*Mycobacterium simulans*" .....

"*Mycobacterium sinense*" .....

*Mycobacterium stomatepieae* ..

*Mycobacterium timonense* .....

*Mycobacterium vulneris* .....

*Mycobacterium yongonense* ...

## RAPIDLY GROWING NTM .....

*Mycobacterium abscessus* .....

*Mycobacterium arabiense* .....

*Mycobacterium aromaticivorans* .

*Mycobacterium bacteremicum* ..

"*Mycobacterium barrassiae*" .....

*Mycobacterium bourgelatii* .....

*Mycobacterium celeriflavum* .....

*Mycobacterium crocinum* .....

"*Mycobacterium franklinii*" .....

"*Mycobacterium fukienense*" .....

"*Mycobacterium hippocampi*" .....

*Mycobacterium insubricum* .....

*Mycobacterium iranicum* .....

*Mycobacterium litorale* .....

*Mycobacterium llatzerense* .....

*Mycobacterium monacense* .....

*Mycobacterium pallens* .....

*Mycobacterium rufum* .....

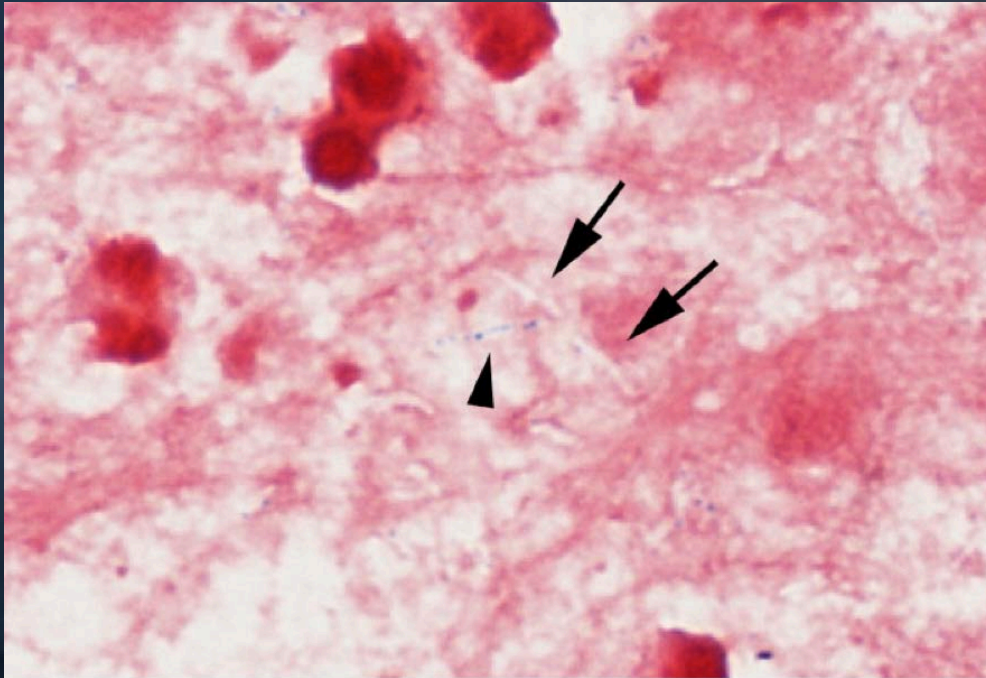
*Mycobacterium rutilum* .....

*Mycobacterium salmoniphilum* ..

*Mycobacterium sediminis* .....

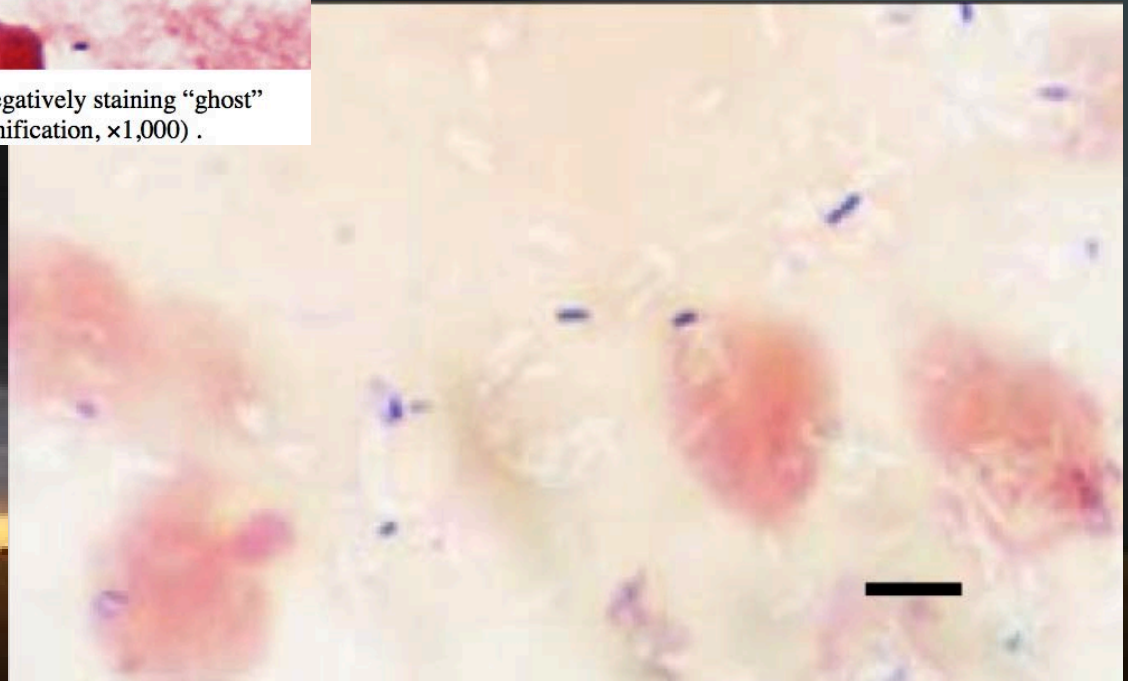
*Mycobacterium setense* .....



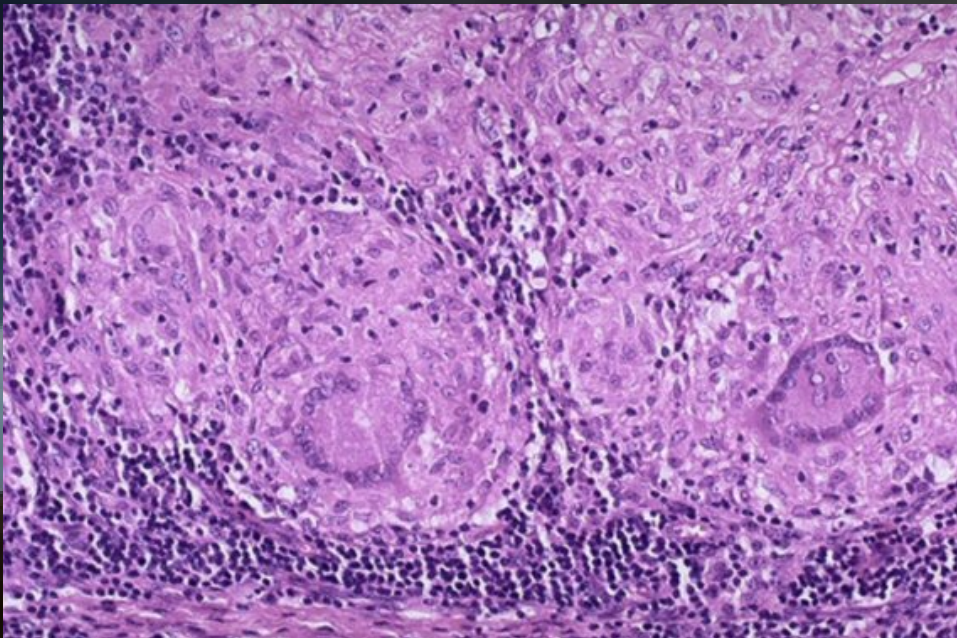
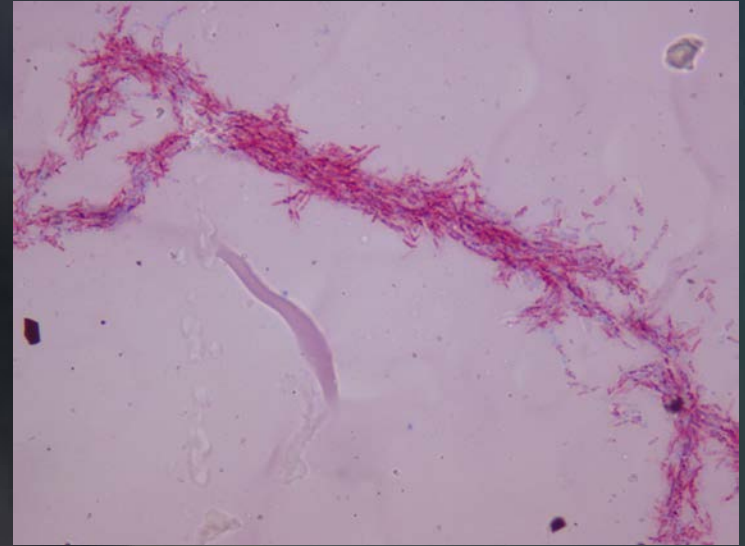
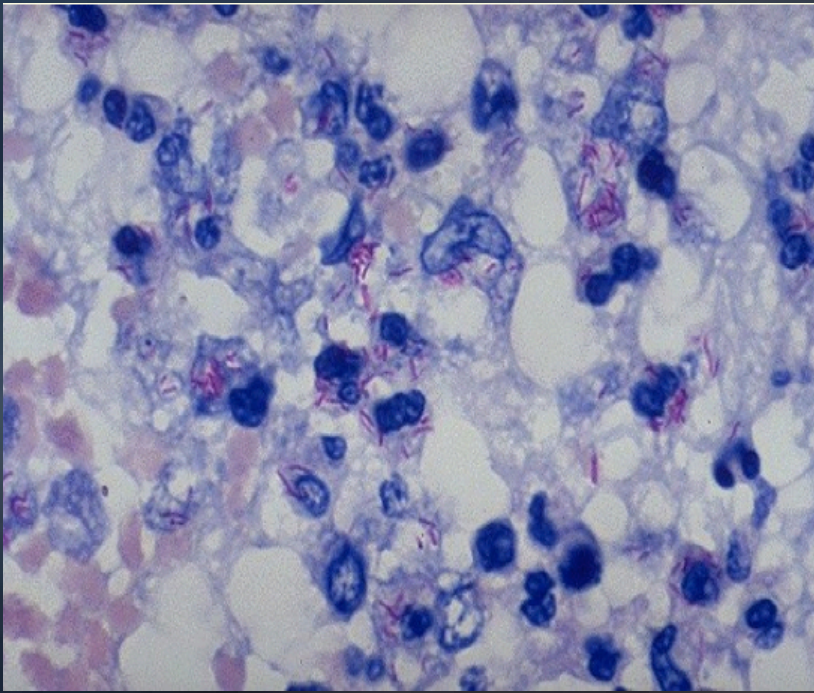


*Gram stain of  
mycobacterium*

**Figure 2.** Gram-stained smear of psoas abscess fluid showing negatively staining “ghost” cells (arrows) and beaded gram-positive cells (arrowhead) (magnification,  $\times 1,000$ ) .







*Acid Fast Strain*

**1**  
Sputum liquefaction  
and inactivation with  
2:1 sample reagent



**2**  
Transfer of  
2 ml material  
into test cartridge



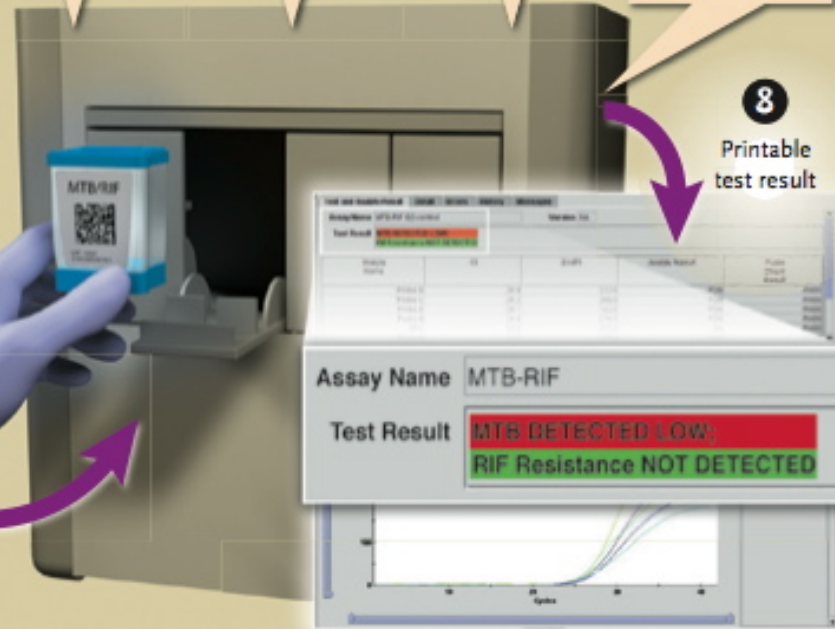
**3**  
Cartridge inserted into  
MTB-RIF test platform  
(end of hands-on work)

**4**  
Sample  
automatically  
filtered and  
washed

**5**  
Ultrasonic lysis  
of filter-captured  
organisms to  
release DNA

**6**  
DNA molecules  
mixed with dry  
PCR reagents

**7**  
Seminested  
real-time  
amplification  
and detection  
in integrated  
reaction tube

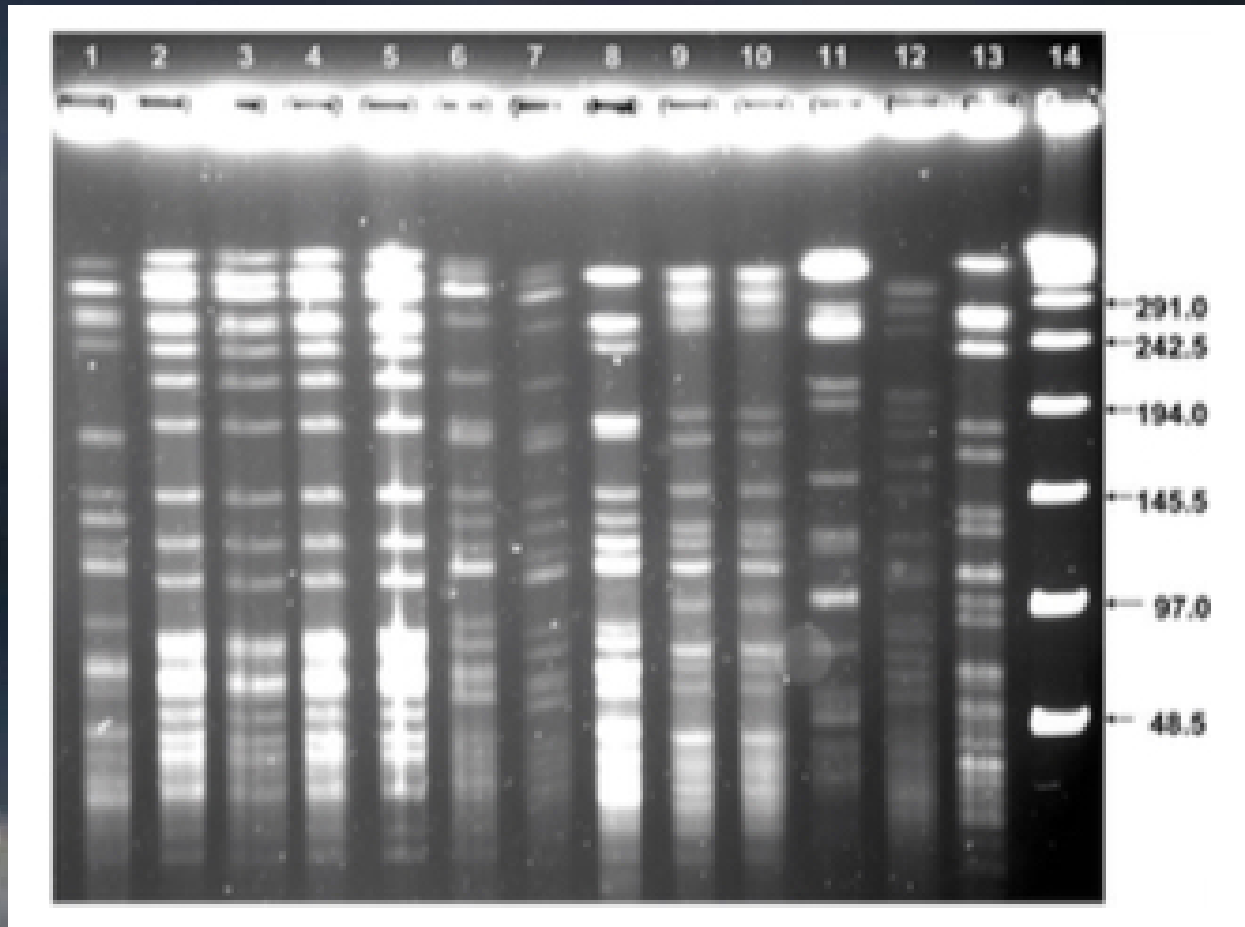


**8**  
Printable  
test result

Assay Name MTB-RIF  
Test Result **MTB DETECTED LOW;**  
**RIF Resistance NOT DETECTED**

Time to result, 1 hour 45 minutes

*Sensitivity of 98.2% and 72.5% with smear positive and negative TB respectively*  
*NEJM 2010:1005*



*Pulsed-Field Gel electrophoresis (PFGE)*

# Dog-sized rats sniff out TB in patients

**Chris Tachibana writes:** Could a giant, spit-sniffing rat save your life? Maybe — they can be better than humans at diagnosing tuberculosis.

A pilot program in Tanzania is using trained rats to smell TB sputum samples. Up to 1,000 samples a week are collected from local hospitals by APOPO, a nonprofit that also trains rats to sniff out landmines. Although the TB samples have already been checked by a human under the microscope, the rat pack's sniff tests have improved disease detection by 44 percent because the clever rodents often find TB that was missed.



Eric Nathan

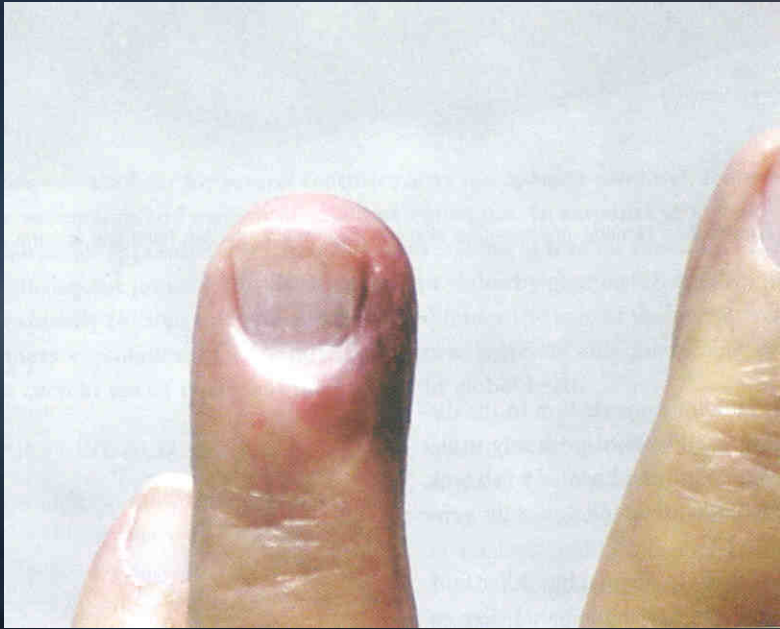
Yes, it's nearly as big as a chihuahua but don't be afraid. Rodents of unusual size, such as these, could save your hide. A pilot program in Tanzania has trained them to detect land mines and also sniff out tuberculosis.



# Fish Tank Exposure and Cutaneous Infections Due to *Mycobacterium marinum*: Tuberculin Skin Testing, Treatment, and Prevention

- 8 patient with soft tissue infection due to *Mycobacterium marinum*; 6 with positive cultures
- All had cutaneous exposure to fish tanks, 7 had sporotrichoid lesions, 2 had deep infections
- All 7 had tuberculin skin test reaction  $> 10$  mm



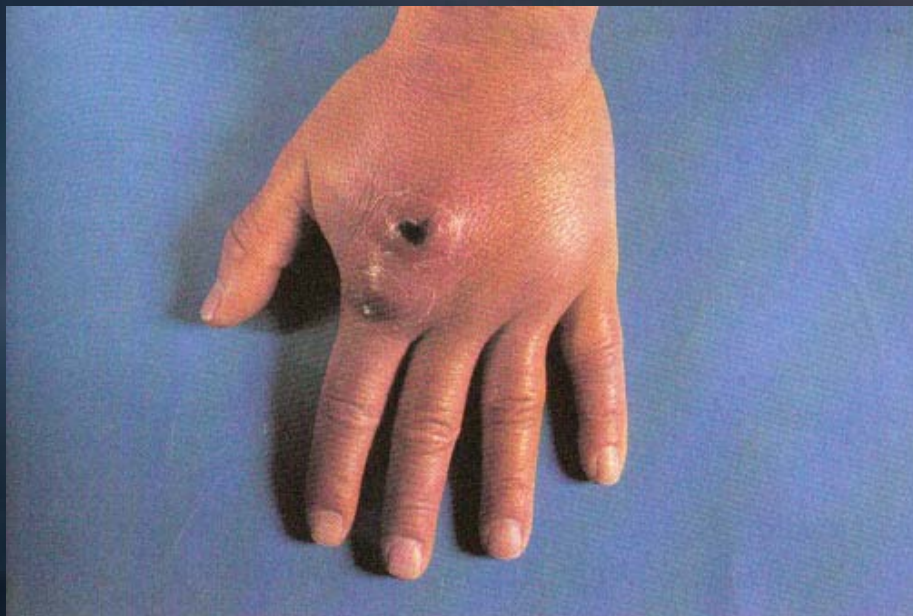


*M. marinum* infections



*M. marinum* infections





*5 weeks later after incision and drainage. Therapy with rifampin and ethambutol*

*Complete healing after extensive debridement and another 4 months of therapy*



## A Cluster of *Mycobacterium wolinskyi* Surgical Site Infections at an Academic Medical Center

- *6 definite cases of M wolinski SSI following cardiothoracic surgery*
- *Case-control study suggested that OR A was significantly associated with M. wolinskyi SSI*
- *Having cardiac surgery in operating room A was significantly associated with infection*
- *As the only difference between OR A and the other ORs in the pod was the presence of a cold-air blaster in OR A*

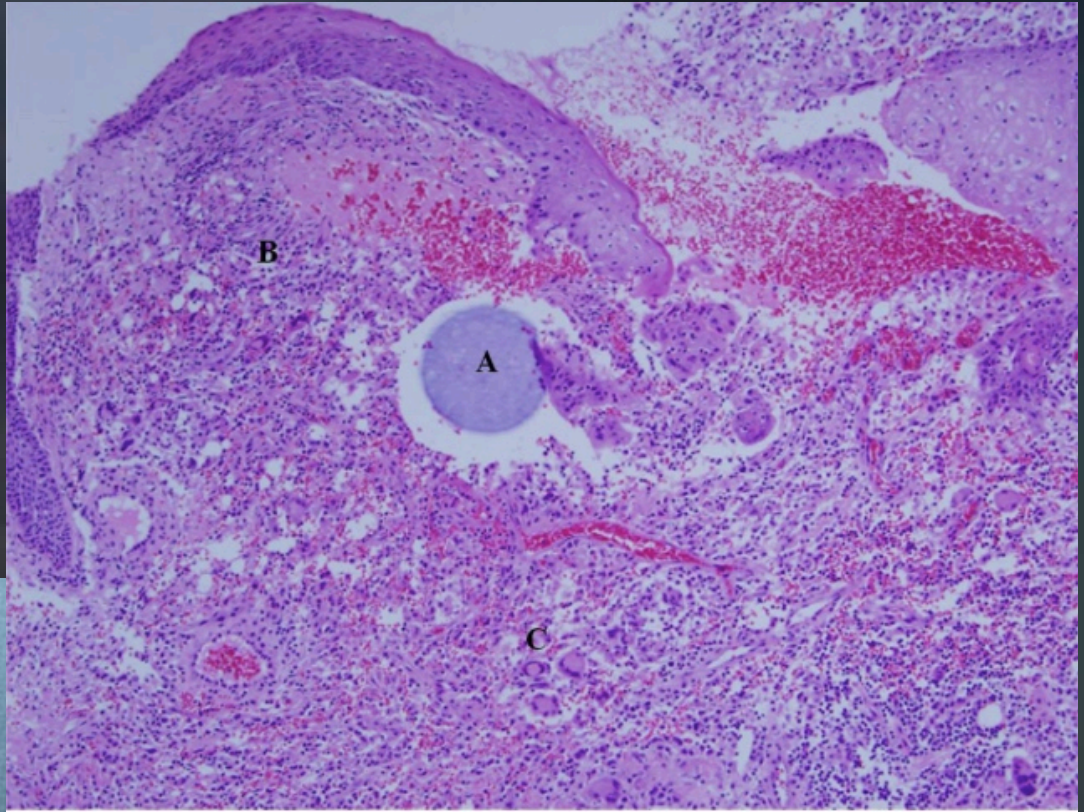
## A Cluster of *Mycobacterium wolinskyi* Surgical Site Infections at an Academic Medical Center

- *No single point source was established, no environmental samples were positive for M wolinskyi including the cold-air blaster*
- *High-volume water cultures from the heart-lung machine water source showed gross bacterial contamination, including Legionella species as well as Mycobacterium gordonii and Mycobacterium avium-intracellulare, but no growth of M. wolinskyi*
- *Removal of a cold-air blaster and replacement of water for heart-lung machine stopped the outbreak*

# Facial skin and soft tissue infection caused by *Mycobacterium wolinskyi* associated with cosmetic procedures (Korea)

- *A 56 yr old Asian woman with a history of receiving multiple facial cosmetic procedures over the preceding 2 years*
- *History of multiple cosmetic procedures of filler injection and laser lipolysis*
- *Presented with right cheek swelling, local pain and erythema*
- *Metallic foreign bodies and abscess were detected by imaging*
- *Pus culture grew *M wolinskyi**





**B**

F/B 1. 10/11/12



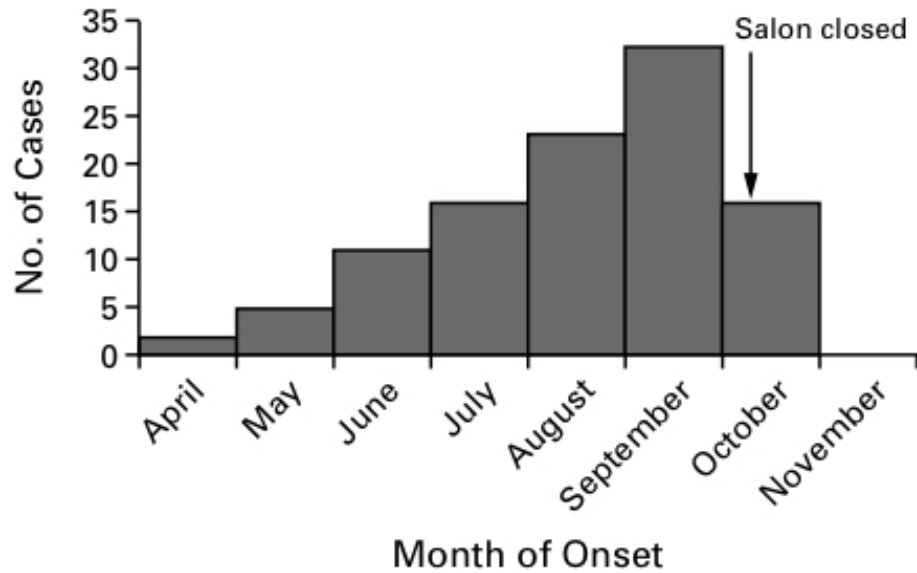
# *Mycobacterium wolinskyi*

- *Belongs to the M smegmatis group, first identified in 1999 by 16S rRNA sequencing*
- *A rapid growing mycobacterium widely distributed in soil and water*
- *Primary associated with posttraumatic or postsurgical wound infections, resulting in cellulitis, osteomyelitis and localized abscess*
- *A case of bacteremia in a lymphoma patient has been reported* (Emerg Infect Dis 2008:1818-1819)

## AN OUTBREAK OF MYCOBACTERIAL FURUNCULOSIS ASSOCIATED WITH FOOTBATHS AT A NAIL SALON

- *110 customers of a nail salon had furunculosis*
- *Cultures from 34 were positive for rapidly growing mycobacteria (32 *M. fortuitum* and 2 unidentified)*
- *Most of the affected patients had more than 1 boil (median, 2; range, 1 to 37)*
- *All patients and controls had had whirlpool footbaths. Shaving the legs with a razor before pedicure was a risk factor for infection*
- *Cultures from all 10 footbaths at the salon yielded *M. fortuitum*. The *M. fortuitum* isolates from three footbaths and 14 patients were indistinguishable by PFGE*
- *Large amounts of hair and skin debris found behind the inlet suction screen of every whirlpool, which was never cleaned*





**Figure 2.** Onset of Infections during the Epidemic.



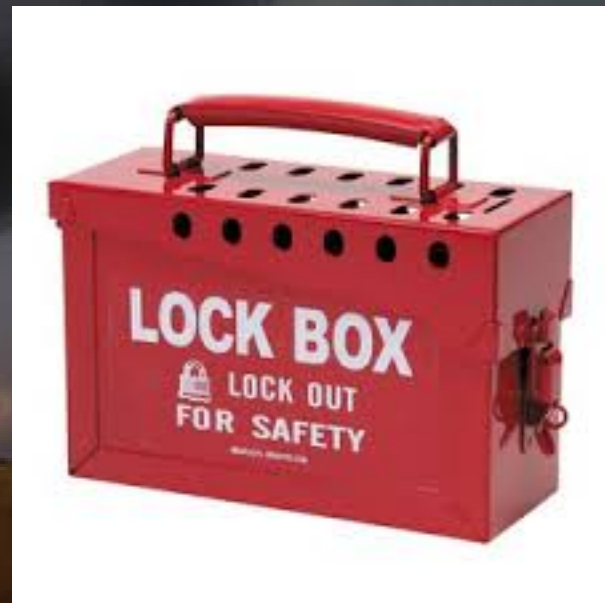
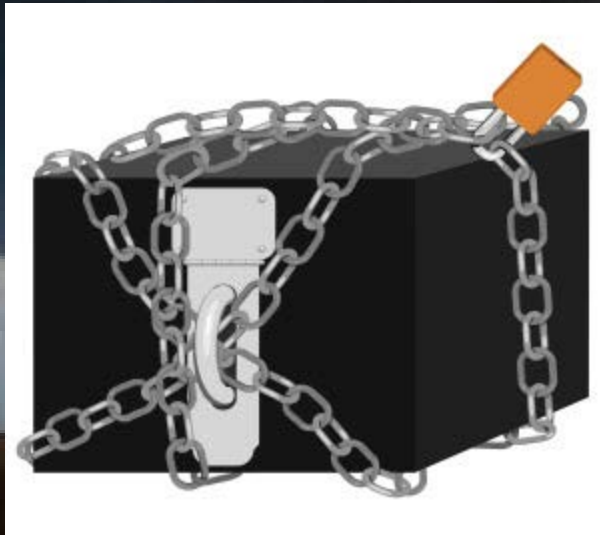
**Table 2. What nail salon patrons should know and do prior to their pedicure<sup>a</sup>**

- Be sure that the salon has a current state license displayed and that the pedicurist is also separately licensed by the state.
- Make sure that the salon is clean and free of trash and that they sterilize reusable instruments (e.g., clippers, nippers, and other metal instruments) between patrons. Although autoclaving is preferred, cold sterilization with chemicals, such as benzalkonium chloride, the key ingredient in common cosmetology disinfectants, such as Barbicide Plus (King Research Inc., Brooklyn, NY), may be used over long periods of time when the product is diluted as recommended on the EPA-registered labeling. Disposable items that cannot be sterilized, such as emery boards, files, and orange sticks, should be discarded after each use. Some salons have individual boxes for each client with their name on it and store both metal and disposable implements there between visits. This is okay, as long as you believe that the pedicurists are not using supplies in your box on someone else. Some people choose to bring their own implements.
- Watch how the pedicurists clean the footbath between customers. Remember that bacteria are trapped beneath the screens and on the filters. Texas law requires that a bleach solution be circulated in the bath for 15 minutes between clients. Ask to see the salon's written log documenting compliance with the state's sanitation rules.
- Do not shave your legs for at least 24 hours prior to your pedicure or get a pedicure if you have broken skin or lesions on your legs.

<sup>a</sup>Adapted from the State of Texas Regulations (12) and reference 2.



My wife always gives me sound advice.  
99% sound... 1% advice

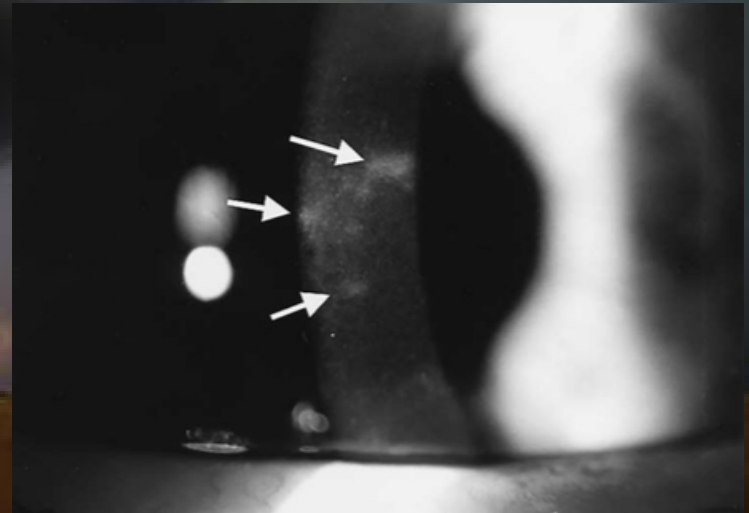


# A Cluster of Cases of *Mycobacterium szulgai* Keratitis That Occurred after Laser-Assisted In Situ Keratomileusis

- *Seven patients had compatible symptoms and signs, 5 of whom had confirmed M. szulgai keratitis.*
- *Five cases occurred among 30 procedures performed by doctor A, and there were no cases among 62 procedures performed by doctor B*
- *Their infections were diagnosed 49-177 days after the operations*
- *Doctor A had chilled syringes of saline solution in ice for intraoperative lavage—the only factor that differentiated the procedures of the 2 surgeons*
- *The saline was drawn into a sterile plastic syringe and fitted with an ocular lavage tip, then chilled on the surface of a tubful of ice obtained from a nearby ice machine.*

- *The lavage tip was kept clear of contact with the ice and the container. Doctor A never had direct contact with the tub of ice during the procedures, but was handed the syringe by a technician, as needed*
- *The ice machine had been routinely maintained and sanitized by flushing all of its water lines and storage bin with bleach and detergent solutions, followed by extensive rinsing to remove the cleansers, procedures similar to the published CDC recommendations*
- *Cultures of samples from the source ice machine's drain identified *M. szulgai*; the strain was identical to isolates recovered from all confirmed cases*

- *All 7 patients had resolution of clinical signs and symptoms. Only 1 patient had persistent deficits in best-corrected vision*
- *M. szulgai was first described as a new species in 1972. It is an uncommon pathogen in humans that principally causes pulmonary infections, but that also causes carpal tunnel syndrome, cutaneous lesions, osteomyelitis, and disseminated infection with lymphadenopathy and osteomyelitis*
- *Presume to live in soil, airborne dust and/or water*



# Cluster of *Mycobacterium Chelonae* Keratitis Cases Following Laser In-situ Keratomileusis

- *Seven patients developed M. chelonae keratitis following bilateral simultaneous LASIK*
- *Infectious keratitis by 13 to 21 days after surgery*
- *M. chelonae keratitis occurred only in persons undergoing correction of hyperopia (seven of 14 eyes vs. none of 217 eyes undergoing myopic LASIK)*
- *The only difference identified between procedures was use of masks created from a soft contact lens in hyperopic LASIK*
- *Three patients isolates were indistinguishable by PFGE*
- *The source of infection was not identified on environmental cultures*

- *The surgeon routinely wears sterile gloves while performing LASIK, but does not change instruments or gloves between eyes of the same patient*
- *Eyes were treated with a combination of antimicrobial agents, including topical azithromycin in three patients, with resolution of infection in all eyes over 6 to 14 weeks.*



FIGURE 1. (Left) The right eye of case 1, 26 days after LASIK, showing focal and diffuse infiltrates at the interface below the lamellar keratectomy flap. (Right) The same eye, 1 month later. There is complete necrosis and nonadherence of the lamellar keratectomy flap, which was subsequently excised. A portion of the central white material is precipitated clarithromycin that is adherent to necrotic tissue.



- *The American Academy of Ophthalmology e-mailed its members asking them to report recent cases of nontuberculous mycobacterial keratitis to the Centers for Disease Control and Prevention*
- *Forty-three additional cases of keratitis were reported (onsets between August 2000 and June 2001). Of these, 31 occurred as part of two unrelated LASIK-associated outbreaks. The 12 other reported cases occurred in sporadic fashion. Of the latter cases, 4 were associated with LASIK surgery*
- *None of the reported cases were related to the M. chelonae cluster in California.*
- *LASIK associated keratitis with nontuberculous mycobacteria may be more common than previously known.*

# Cutaneous Inoculation of Nontuberculous Mycobacteria During Professional Tattooing: A Case Series and Epidemiologic Study

- *5 confirmed and 26 suspected cases of NTM inoculation from 2 professional tattooing artists*
- *3 confirmed infections grew Mycobacterium abscessus and 2 grew Mycobacterium chelonae*
- *Symptoms occur 1-4 weeks after tattooing; "itching and pain are common symptom"*
- *Further investigation revealed two unlinked clusters*
- *Cluster A comprised 27 infections by the same artist using brand A black ink (3 biopsy & culture confirmed cases)*
- *Cluster B comprised 4 infections from using brand B graywash ink (2 biopsy and culture confirmed cases)*
- *No infections were identified among either artist's clients with previous or subsequent bottle of ink*

- *Company of brand A received 35 complains of unusual skin reactions in 19 states, and identified a single batch and issued a recall*
- *Company B declined to provide ingredients or sources of ink and denied receiving any complains*
- *No NTM was recovered from brand A ink samples; brand B ink sample from the tattoo artist grew *M chelonae* indistinguishable from patient isolated by PFGE*



# Outbreak of *M chelonae* Infection Associated with Tattoo Ink

- *A persistent raised erythematous rash in the tattoo area developed in 19 person (13 men & 6 women) within 3 weeks after tattoo from a single artist who used premixed gray ink*
- *M chelonae was isolated from 14 of 17 patient skin biopsy specimens*
- *PFGE analysis showed indistinguishable pattern in 11 clinical isolates and one of three unopened bottles of premixed ink*



In this January 2012 photo provided by the Monroe County Department of Public Health, a person's arm is covered with a red bubbly rash after receiving a tattoo. Health officials are seeing more cases of a nasty skin infection blamed on the ink. In the largest outbreak reported, 19 people in Rochester ended up with bubbly rashes over their new tattoos. / AP

## Tattoo-Associated Nontuberculous Mycobacterial Skin Infections — Multiple States, 2011–2012

TABLE. Characteristics of nontuberculous mycobacteria (NTM) tattoo-associated skin infection clusters — multiple states, 2011–2012

State	No. of cases			Mycobacterium species identified	Tattoo ink supplier and type		Note
	Confirmed	Probable	Possible		Company	Ink	
New York	14	4	1	<i>M. chelonae</i>	A	Prediluted gray	Clinical and company A ink isolates indistinguishable
Washington	3	0	24	<i>M. abscessus</i>	B	Black	No NTM isolated from company B ink
Washington	2	0	2	<i>M. chelonae</i>	C	Gray	Clinical and company C ink isolates unrelated
Iowa	2	0	0	<i>M. chelonae</i>	C	Black	Available clinical isolates from Iowa cluster and Washington cluster 2 were indistinguishable
Colorado	1	0	0	<i>M. chelonae</i>	D	Black	Clinical isolate was unrelated to New York or Washington isolates, no NTM isolated from ink

*Reports from the United States, France, Spain, and Australia underscore the public health impact of NTM infections associated with professional tattoos*

## Allergic Contact Dermatitis from a Henna Tattoo

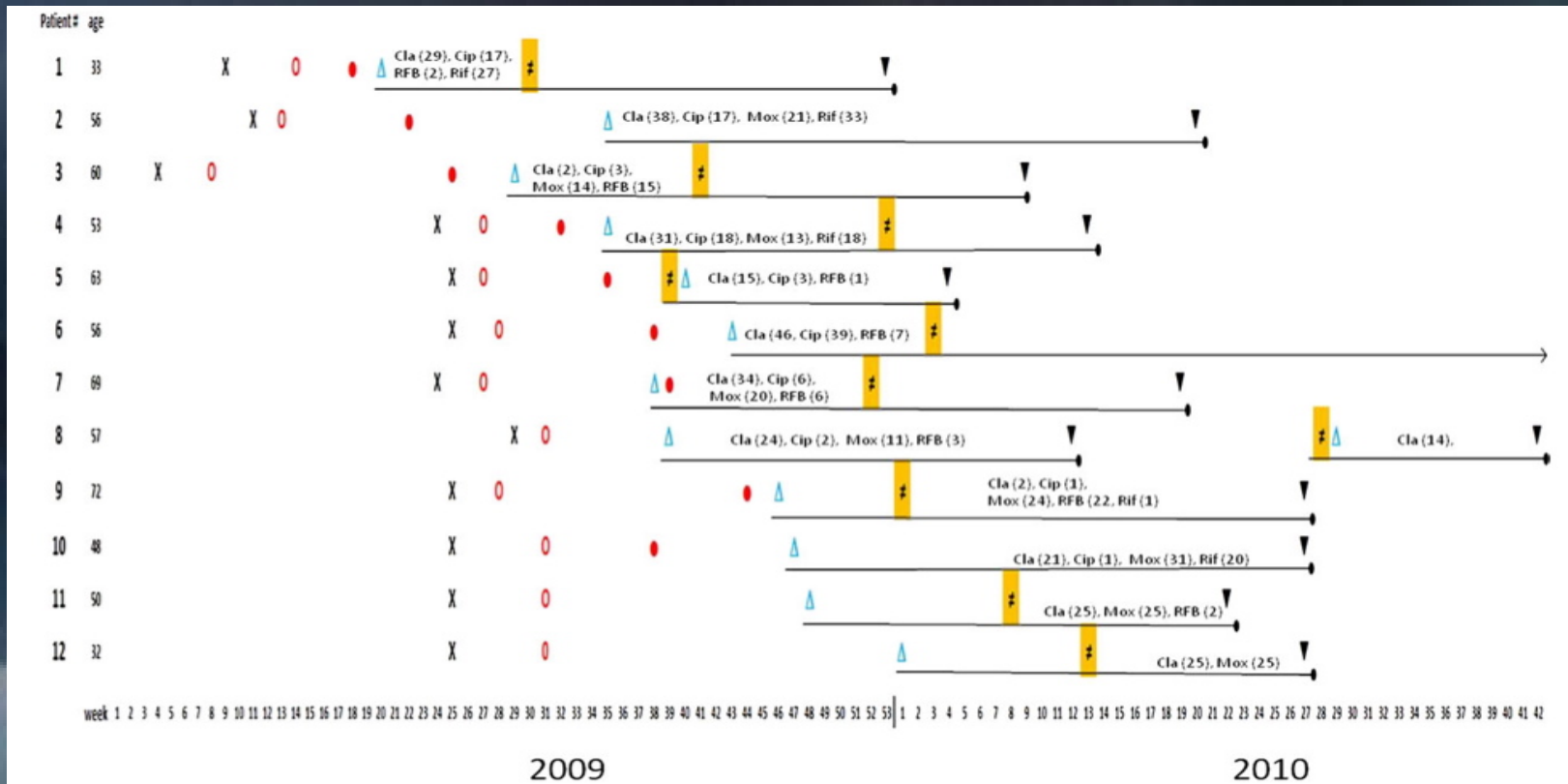


## Outbreak of *Mycobacterium haemophilum* Infections after Permanent Makeup of the Eyebrows

- *Mycobacterium haemophilum* outbreak after permanent make-up of the eyebrows by the same freelance artist
- Twelve patients presented an eyebrow lesion and cervical lymphadenitis
- All 12 patients were female, medium age 56 years, none were immunosuppressed
- Incubation time was 3 weeks (2-7 weeks)
- Patients presented an inflammatory lesion of one eyebrow, consisting of a few red papules or pustules or an erythematous plaque. In all cases the lesion was associated with ipsilateral lymphadenopathy in the parotid region, affecting 1 or more lymph nodes (median 2, range 1-5)
- 8 patients presented with an abscess, 7 developed into a fistula
- The tattoo artist stated that she had performed permanent make-up on □400 women during the outbreak period, but it was not possible to identify and contact these women



- All were treated with antibiotics. Surgery was required in 10 cases.
- *M haemophilum* DNA was identified in the make-up ink and from 10 patient isolates.



**Figure 2.** Timescale of permanent makeup application, onset of clinical manifestations, and treatment in the 12 patients described in the text. Legend: X: Permanent make-up application; O: Onset of symptoms; ●: Diagnosis (first contributive clinical specimen); Δ: Start of antibiotic treatment; ▼: End of antibiotic treatment; ≠: Surgery; Antibiotics (treatment duration in weeks): Cla: clarithromycin; Cip: ciprofloxacin; Mox: moxifloxacin; RFB: rifabutin; Rif: rifampin



**Figure 1.** Typical clinical manifestation of *M. haemophilum* infection after permanent makeup. *A*, Inflammatory lymphadenopathy affecting the parotid region. *B*, Erythematous plaque over the eyebrow tattoo. *C,D*, Outcome after surgery and antibiotic treatment.

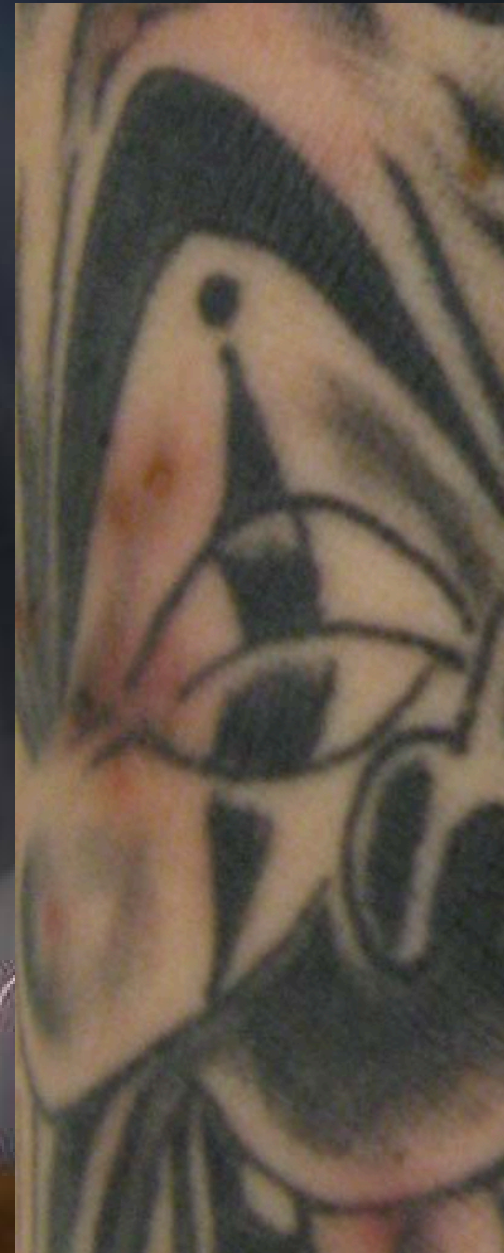
- *Mycobacterium haemophilum* is an uncommon pathogen in humans and mainly causes infections in immunocompromised patients.
- Cutaneous lesions, septic arthritis with or without osteomyelitis, and disseminated infection with skin lesions and osteomyelitis are the principal manifestations
- Requires ferric ammonium citrate or hemin for growth.
- Optimal temperature between 30 to 32°C



FIG. 4. Ulcerative lesions on the legs of the renal transplant patient in Fig. 3 (patient 1, Table 3).



**Tattoo-associated  
*Mycobacterium  
haemophilum*  
Skin Infection in  
Immunocompetent  
Adult, 2009**



*Mycobacterium haemophilum* is the second most common cause of cervicofacial lymphadenitis after *M avium* in pediatric population



## Outbreak of *Mycobacterium abscessus* Wound Infections among “Lipotourists” from the United States Who Underwent Abdominoplasty in the Dominican Republic

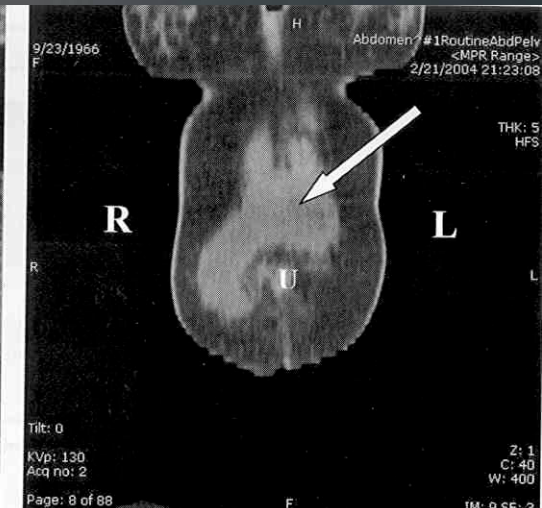
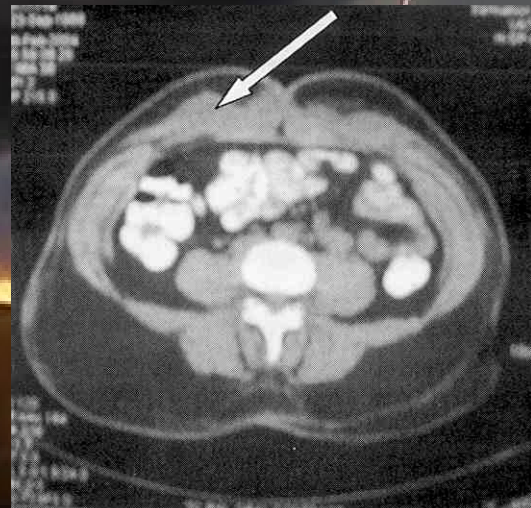
- *20 returning US travelers with M abscessus infection were identified*
- *19 were interviewed, all female age 19-57 (median age 33)*
- *8 with matching PFGE Isolates*
- *Symptoms developed 2-18 weeks after surgery (median 7 weeks)*
- *All had infections of abdominoplasty wounds*
- *Some also had undergone breast surgery, 2 had breast infection*
- *Most presented with painful, erythematous, draining subcutaneous abdominal nodules, none shown leukocytosis or fever*

## Outbreak of *Mycobacterium abscessus* Wound Infections among “Lipotourists” from the United States Who Underwent Abdominoplasty in the Dominican Republic

- *5 patients were hospitalized, all but 1 were eventually cured after a median of 9 months of therapy (range, 2-12 months)*
- *Gram stain of the wounds revealed PMNs, 4 had positive AFB smear*
- *M abscessus; takes 3-38 days (median 6 days) to grow in culture*
- *Potential contamination included environmental contamination of water system, surgical instruments, gentian violet, injectable medications and antiseptic solutions*



*Mycobacterium  
abscessus abdominal  
wall abscess*



*Clin Infect Dis 2008:1181-1188*



# An Outbreak of *Mycobacterium chelonae* Infection Following Liposuction

- *Among 82 patients who underwent liposuction performed by a single practitioner in a 6-month period, 34 (41%) developed cutaneous abscesses*
- *The physician reported having completed a residency in otolaryngology and facial plastic surgery and having performed liposuction for 12 years. The physician was not board certified in these specialties*
- *Surgical technician had no formal training in operative techniques or infection control*
- *Mycobacterium chelonae was recovered from 12 patients*
- *Risk factors indicated that inadequate sterilization and rinsing of surgical equipment with tap water were likely sources of mycobacterial contamination*

# AAPS: Liposuction: How safe is it?

RSi Communications

Apr 13, 2015

281 views



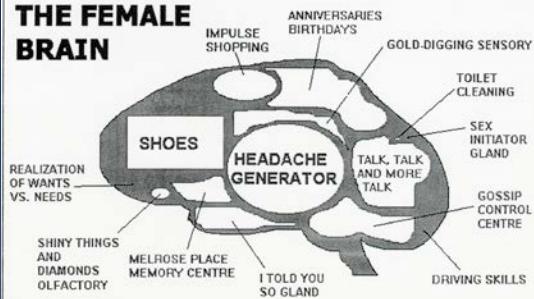
as presented at the annual  
Association of Plastic Surgeons

Liposuction alone is associated with a higher complication rate, according to a study presented at the annual meeting of the American Society of Plastic Surgeons in Scottsdale, Arizona. But when liposuction is combined with other procedures or performed on larger areas, complication rates rise significantly.

Researchers at Vanderbilt University and their colleagues assessed a total of 1,000 patients who underwent liposuction procedures between 2000 and 2010.

*The incidence of significant complications was 0.7% with liposuction alone, 3.8% when combined with abdominoplasty, and 12% when combined with abdominoplasty, breast, and another body contouring procedure.*

## THE FEMALE BRAIN



FOOTNOTE: The "Put Oil into the Car" and "Be Quiet During the Game" glands are active only when the "SHINY THINGS AND DIAMONDS" Olfactory has been satisfied or when there is a shoe sale.

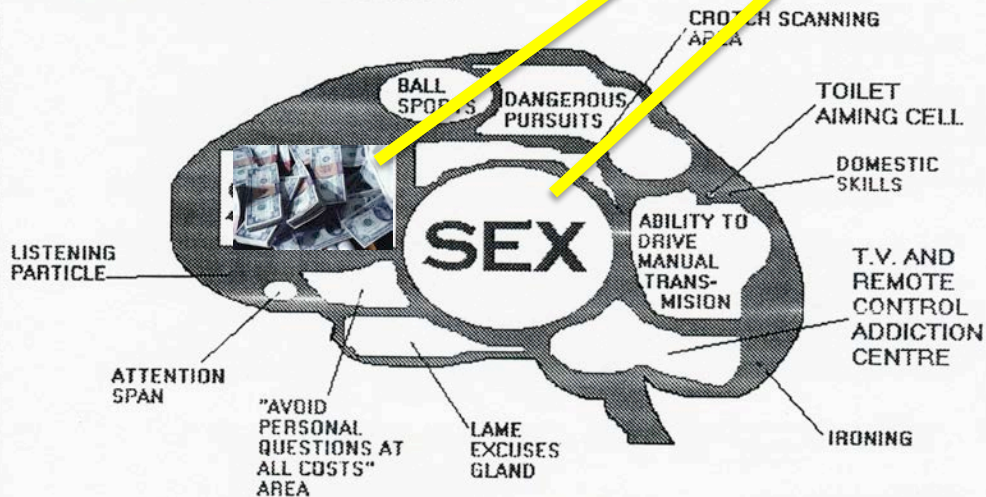
## More Sex, More Money?

NEW RESEARCH SUGGESTS A CORRELATION

- More than four times a week = 5% higher wages
- No sexual activity = 3% less in wages

Source: Anglia Ruskin University Study, Study of Labor in Bonn

## THE MALE BRAIN

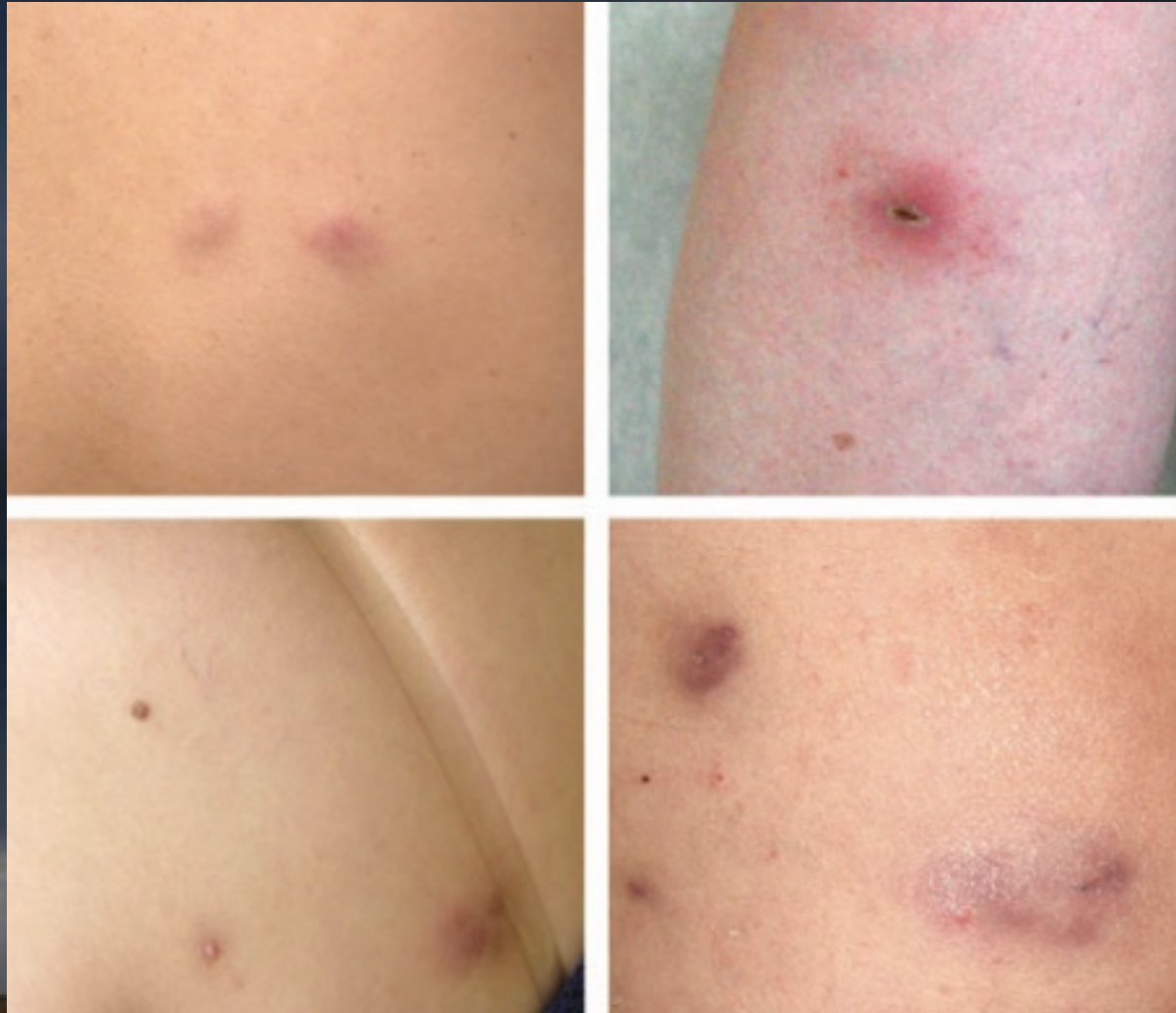


FOOTNOTE: the "Listening to children cry in the middle of the night" gland is not shown due to its small and underdeveloped nature. Best viewed under a microscope.

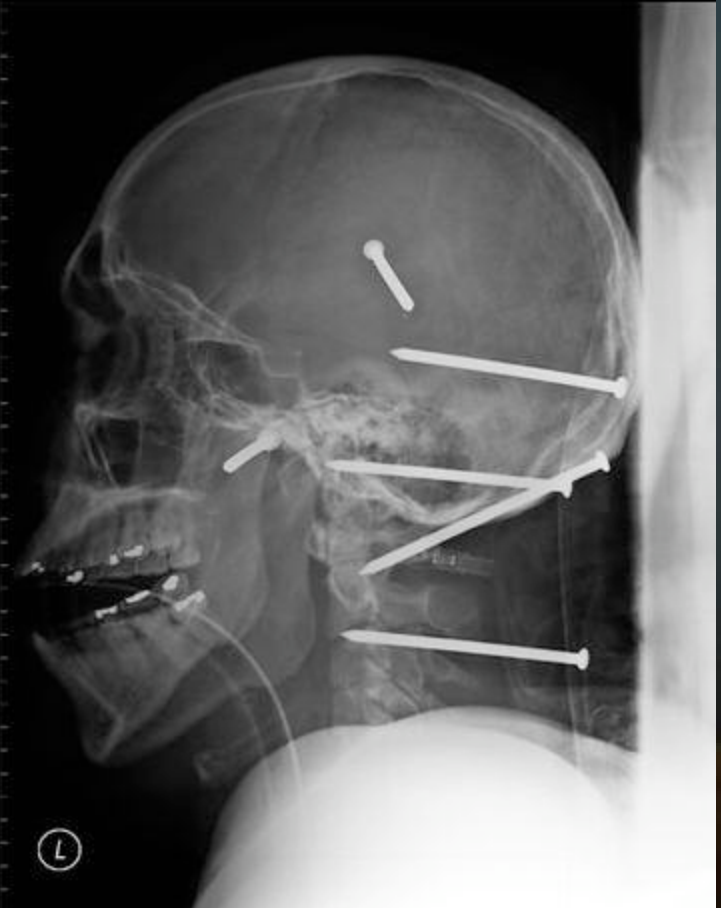
**An outbreak of skin and soft tissue infection caused by *Mycobacterium abscessus* following acupuncture (Korea)**

- *An outbreak of M. abscessus skin and soft tissue infections following acupuncture among the patients who visited an oriental medical clinic*
- *From 1002 patients interviewed, 109 patients were identified as having suffered M. abscessus skin and soft tissue infections at acupuncture sites*
- *The case-control study revealed that a higher numbers of visits to the clinic for acupuncture and the use of interferential current therapy or low-frequency therapy were associated with the development of M. abscessus infection*
- *M. abscessus was not isolated from the undiluted (2%) glutaraldehyde solution, the faucet, the tap water, or the water tank in the building*

- *Among 50 environmental samples examined, M. abscessus was isolated from 9 samples taken from diluted glutaraldehyde solution, electrodes for interferential current therapy devices and low-frequency electric therapy devices, beds, a sink, and a water bucket in the procedure room*
- *31 clinical isolates and 9 environmental isolates were identical by RAPD-PCR and PFGE*
- *After treatment of the last patient of the day had been completed, the electrodes of low-frequency therapy and interferential current therapy were soaked in diluted (1%) glutaraldehyde solution overnight. The used diluted glutaraldehyde solution was discarded the next morning*
- *It was reported that a large amount of diluted glutaraldehyde solution had been prepared by adding the same amount of tap water months before*



# Acupuncture with Gold Thread for Osteoarthritis of the Knee



## An Outbreak of *Mycobacterium jacuzzii* Infection following Insertion of Breast Implants (Israel)

- *15 women developed surgical site infection with M. jacuzzii, all implants had to be removed*
- *The mean interval between surgery and onset of infection was 28 days*
- *Identical strains of M jacuzzii was isolated from infected wounds as well as the eyebrows, hairs from scalp, face, nose, ear and groin of the surgeon; Also from his bed linen, pillows, towels bathrobe and car air conditioning.*





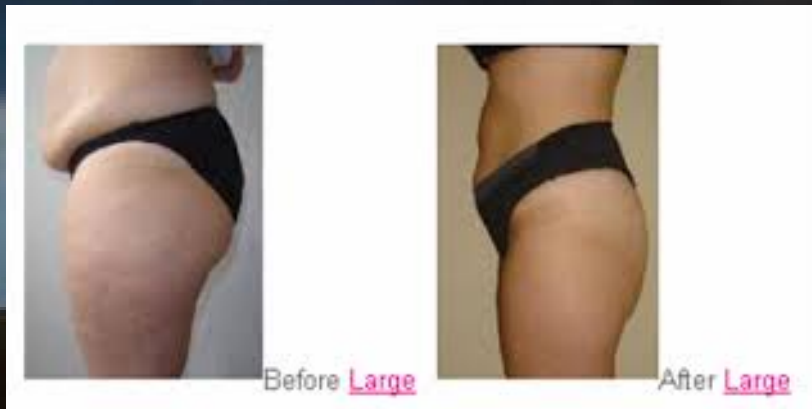
# An Outbreak of *Mycobacterium jacuzzii* Infection following Insertion of Breast Implants (Israel)

- *M jacuzzii* was also isolated from his outdoor home whirlpool
- Another whirlpool user in his family had colonization with the same mycobacteria
- Outbreak stopped after the surgeon cleaned himself daily with a body scrub and shampoo containing triclosan and stopped using the whirlpool
- During surgery, he wore a hood-style cap that cover all exposed facial area

## Outbreak of Nontuberculous Mycobacterial Subcutaneous Infections Related to Multiple Mesotherapy Injections<sup>∇</sup> (France)

- *Sixteen patients were infected after mesotherapy injections performed by the same physician*
- *All patients presented with painful, erythematous, draining subcutaneous nodules at the injection sites*
- *All patients were treated with surgical drainage*
- *Mycobacterium chelonae was identified in 11 patients, and Mycobacterium frederiksbergense was identified in 2 patients*
- *The mean duration of treatment was 14 weeks (range, 1-24 weeks)*
- *All of the patients except 1 were fully recovered 2 years after the onset of infection, with the mean time to healing estimated at 6.2 months (range, 1-15 months)*
- *The assessment of hygiene practices showed inappropriate cleaning of the automatic repetitive injector with nonsterile tap water*

- *Mesotherapy was first introduced in France in 1952, consisting of an injection of highly diluted drugs and different substances into the dermis and subcutaneous tissue*
- *This technique was originally developed to treat localized pain, vascular and lymphatic disorders*
- *Mesotherapy is best defined as the introduction of a solution under the skin in an effort to melt fat, there is no "standard" formula used for mesotherapy. This means that physicians (and others) are left to devise their own cocktails with which to proceed.*



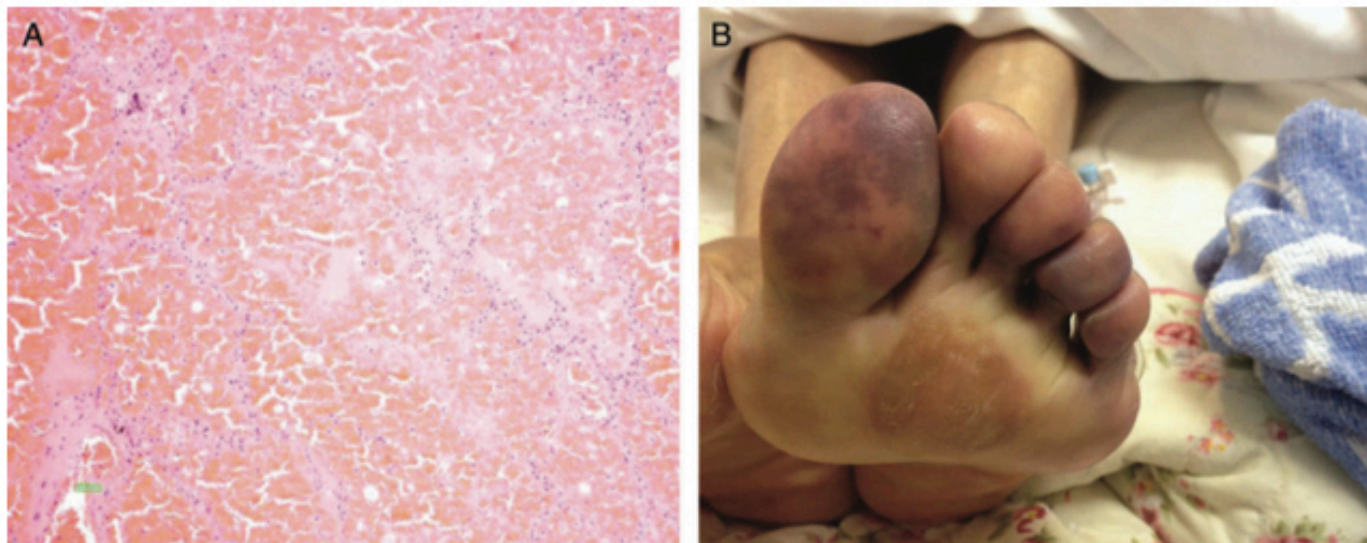


*Mesotherapy for  
facial rejuvenation*

# *Mycobacterium abscessus* Bacteremia After Receipt of Intravenous Infusate of Cytokine-Induced Killer Cell Therapy for Body Beautification and Health Boosting (Hong Kong)

- *Four patients were admitted, and 3 patients had septic shock. Chest radiographs showed pulmonary infiltrates in all patients. Three patients developed peripheral gangrene, and 1 patient required lower limb and finger amputations*
- *3 were admitted to ICU*
- *All patients had received CIK cells for body beautification and health boosting from a beauty treatment center*
- *Patient 1 also developed disseminated infection including meningitis and urinary tract infection, died 6 days after hospitalization*
- *All survivors required prolonged intravenous antibiotics. Blood cultures grew *M. abscessus* for all patients*
- **Mycobacterium abscessus* was also isolated from respiratory specimens (2 patients), urine (1 patient), and cerebrospinal fluid (1 patient)*

*As our population is aging, there is increasing demand for cosmetic medicine due to the strong belief that beauty is associated with health in our local population. Although CIK cells were used as salvage therapy for relapsed or disseminated cancer patients, this form of immunological manipulation unfortunately has been promoted as a form of health boosting. In Hong Kong, there is currently no legislation regulating CIK clinics or beauty salons*



**Figure 1.** Pulmonary and extrapulmonary complications. A, Postmortem examination of patient 1, showing pulmonary hemorrhage (hematoxylin-eosin

**"The secret of staying young is to live honestly...  
eat slowly, and lie about your age."**

[www.pmcaregivers.com/Humor.htm](http://www.pmcaregivers.com/Humor.htm)

Clin Infect Dis 2013:981-991

**“THIS PRODUCT IS NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.”**



**“THIS SERVICE IS INTENDED FOR HEALTHY ADULTS”**  
- FROM HANGOVERCLUB.COM



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By **PARVATI SHALLOW** / CBS NEWS / April 21, 2015, 5:00 AM

# Does IV therapy really cure hangovers?



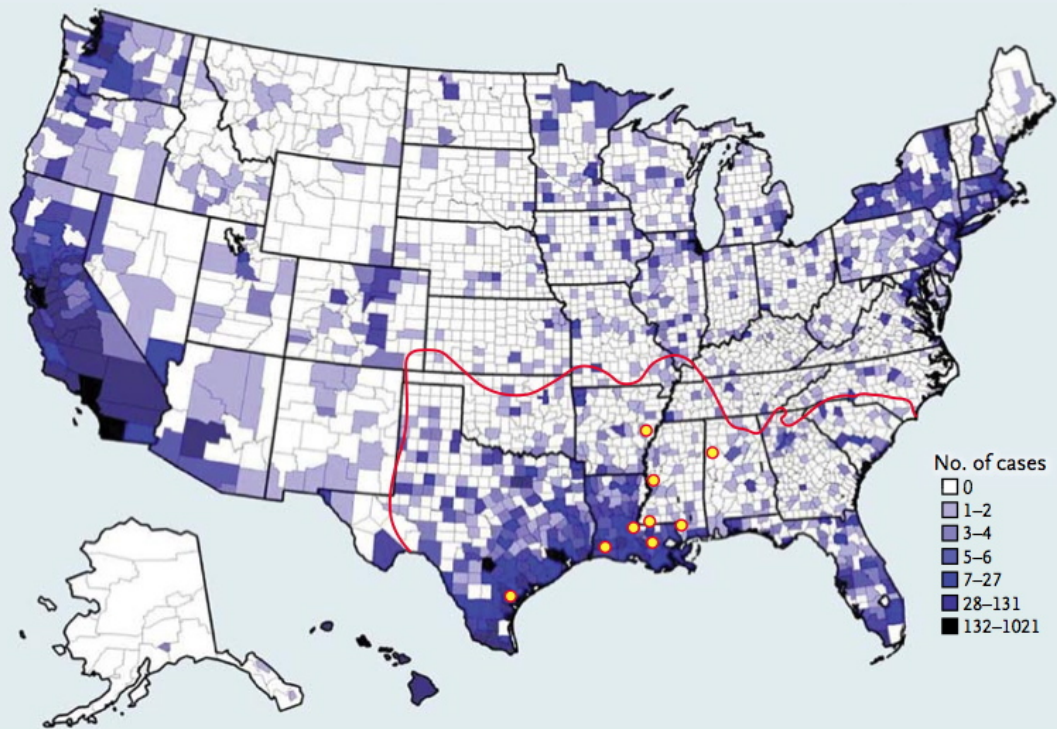


# Probable Zoonotic Leprosy in the Southern United States

- *DNA samples were taken from 33 wild armadillos in Arkansas, Alabama, Louisiana, Mississippi and Texas*
- *Skin biopsies from 50 leprosy patients being treated at a Baton Rouge clinic. Three-quarters had never had foreign exposure, but lived in Southern states where they could have been exposed to armadillos*
- *A unique *M. leprae* genotype (3I-2-v1) was found in 28 of the 33 wild armadillos and 25 of the 39 U.S. patients who resided in areas where exposure to armadillo-borne *M. leprae* was possible*
- *This genotype has not been reported elsewhere in the world.*

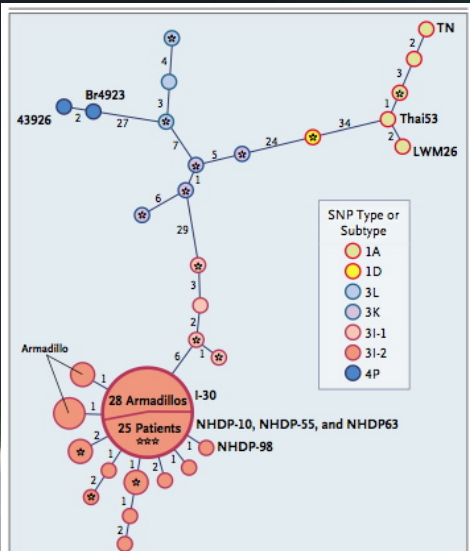


*Fite stain of the dermis*



**Figure 1. Distribution of Leprosy in the United States.**

Counties in which leprosy cases have been reported are shown, with darker color indicating a greater total numbers of cases since 1894, according to the National Hansen's Disease Registry. The currently estimated range of armadillos is outlined in red. Yellow circles indicate approximate locations of wild armadillos infected with *Mycobacterium leprae* — in Arkansas, Alabama, Louisiana, Mississippi, and Texas — suggesting that the central Gulf Coast is an area of endemic transmission to people. Leprosy cases in counties outside the armadillos' range are due to familial contact, foreign exposure, or unknown sources.



**Figure 3. Minimum-Spanning Phylogenetic Tree of *Mycobacterium leprae* Genotypes Based on Analysis of Single-Nucleotide Polymorphisms (SNPs) and Variable-Number Tandem Repeats (VNTRs).**

Minimum-spanning-tree analysis was performed with the use of combined VNTR and SNP data from human and armadillo *M. leprae* strains. Each circle represents a genotype (human unless marked as armadillo) based on the combined data, with the circle size directly proportional to the number of strains with the corresponding genotype. Numbers along the links between circles indicate the number of loci that differ between the genotypes on either side of the link. Three fully sequenced reference *M. leprae* strains (TN, Thai53, and Br4923<sup>22,23</sup>) are labeled, as are two other reference strains (LWM26 and 43926) of foreign origin. Samples from patients with a history of foreign residence are indicated with an asterisk (with three asterisks indicating three patients). The 114 polymorphisms investigated include 84 SNPs described previously<sup>24</sup> and 30 identified during our study; 10 VNTRs were also analyzed. The large circle illustrates the predominance of the 3i-2-v1 *M. leprae* genotype in our study, with 25 patients and 28 armadillos having this identical genotype.



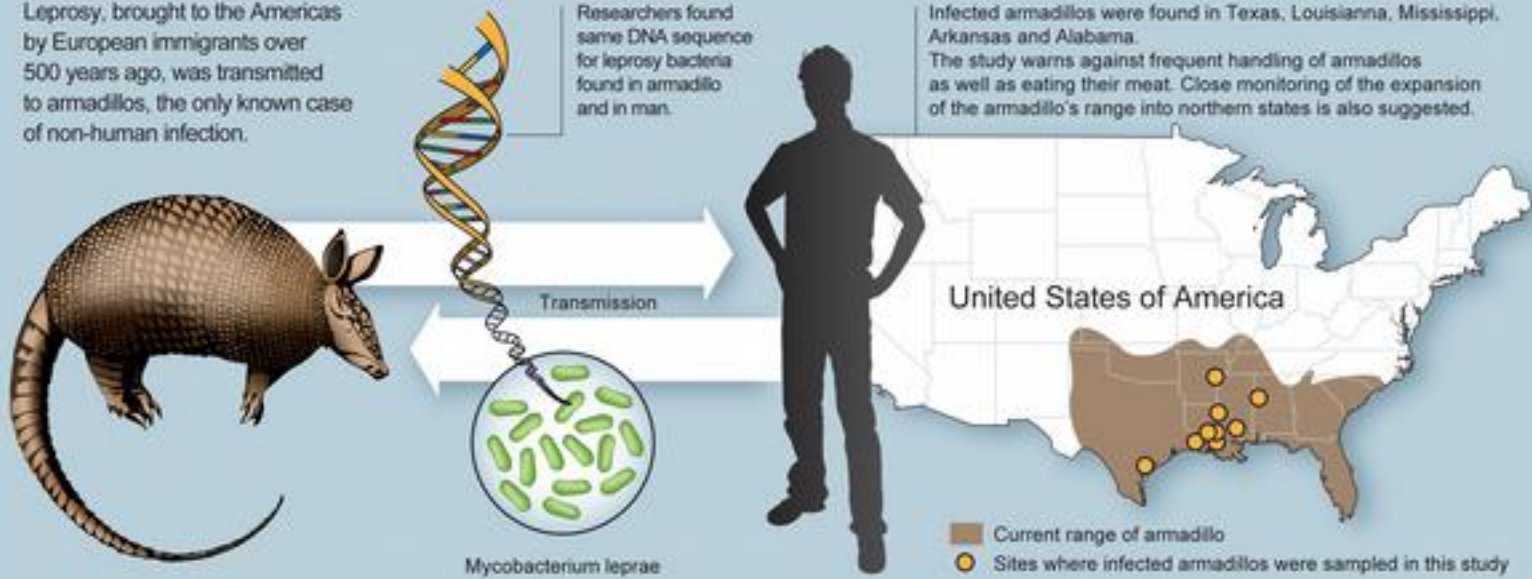
"hillbilly speed bumps"

## Leprosy bacteria transmission from armadillo to man

Leprosy, brought to the Americas by European immigrants over 500 years ago, was transmitted to armadillos, the only known case of non-human infection.

Researchers found same DNA sequence for leprosy bacteria found in armadillo and in man.

Infected armadillos were found in Texas, Louisiana, Mississippi, Arkansas and Alabama. The study warns against frequent handling of armadillos as well as eating their meat. Close monitoring of the expansion of the armadillo's range into northern states is also suggested.





**WESTSIDE BAPTIST CHURCH**

**WAR EAGLE ROLL  
TIDE JESUS CHRIST  
IS ON YOUR SIDE**

**PASTOR MIKE KEEHN**

**SUNDAY SCHOOL**

**10:00 AM**